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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Shigeo Mikoshiba

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08/17/2006

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EXAMINER

GUHARAY, KARABI

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 08/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/935,577

Applicant(s)

MIKOSHIBA ET AL.

Examiner

Karabi Guharay

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment, filed on June 1, 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-6, 8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-6, 8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Amendment, filed on June 01, 2006 has been considered and entered.

Claims 2 & 7 are canceled.

Claim 9 is added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-6 & 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinori (JP08-162069), and further in view of Hamon et al. (US 5471112).

Regarding claim 1, Yoshinori discloses a vacuum ultraviolet radiation excited light emitting device (fluorescent lamp, Fig 1 & 4) comprising a discharge space (1a, 90a) filled with rare gas between a front faceplate (1, 91) and a rear faceplate (2, 92) wherein the front faceplate (1, 91) is that which faces the observer (since faceplate 1 is the luminescent side) and a fluorescent material (5, 95) provided on the front faceplate (1, 91, see paragraph 2-4 & paragraph 8 of English Translation), the fluorescent material layer having thickness of not more than 7 micron (see English Abstract), and further comprising a fluorescent material layer (8) on the rear faceplate (see Fig 1).

However, Yoshinori is silent about the average primary particle diameter of the fluorescent material.

However, in the same field of UV radiation excited light emitting device (plasma device), Hamon teaches a front substrate with fluorescent material layer having

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than 7 micron and average particle size is not more than 1 micron particularly not more than 0.5 micron (see lines 10-16 of column 5). Hamon further teaches that such smaller diameter reduces the coefficient of reflectance, resulting in a better contrast ratio (lines 27-33 of column 5).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate fluorescent material having mean diameter less than 1 micron, as taught by Hamon, in the device of Yoshinori, since this will reduce the reflectance of ambient light and improves contrast.

Regarding claim 3, Yoshinori discloses that the vacuum ultraviolet excited light-emitting device is a rare gas lamp (lamp having discharge containing rare gas).

Regarding claim 5, Yoshinori discloses that the vacuum ultraviolet excited light-emitting device is a plasma display device (since plasma is generated through breakdown of rare gas).

Regarding claim 6, Yoshinori discloses that the thickness of the fluorescent material layer (8) on the rear faceplate has a thickness of not more than 20 micron (see English Abstract).

Regarding claim 8, Yoshinori discloses fluorescent powder, which produces red, green and blue light (see paragraph 18 of English Translation), but does not specifically disclose the type of phosphor.

However, $Y_2O_3:Eu$, $Y_2O_2S:Eu$, $(Y, Gd)BO_3:Eu$, $BaAl_{12}O_{19}:Mn$, $BaMgAl_{10}O_{17}:Mn$, $BaMgAl_{14}O_{23}:Mn$, $Zn_2SiO_4:Mn$, $BaMgAl_{10}O_{17}:Eu$ or $BaMgAl_{14}O_{23}:Eu$ are well known fluorescent materials for red green and blue emission.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use these well known fluorescent material in the device of Yoshinori as red green and blue phosphor powder, since selection of known materials for known purposes is within the skill of art.

Claims 1 & 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohsawa et al. (US 5,939,826) in view of Murata et al. (US 6,611,099).

Regarding claim 1, Ohsawa discloses a vacuum ultraviolet radiation excited light-emitting device comprising a discharge space S filled with a rare gas between a front faceplate 3 and a rear faceplate 1, and a fluorescent material layer 7 provided on the front faceplate, and teaches a fluorescent material on the rear faceplate (see Fig 9). Ohsawa teaches the thickness of the fluorescent material on the front faceplate to be optimized to produce a thin layer, which avoids attenuation of light (see Col. 6, lines 7-10 and 20-25), but is silent regarding the limitation of "the thickness being less than 7 μm ", and the average particle diameter is less than 1 micron.

However, in the same field of endeavor, Murata discloses a PDP comprising a fluorescent material having a thickness of less than 7 μm and particle diameter less than 1 micron (lines 58-66 of column 7) and teaches said thickness to be suitable for reducing the voltage applied to the fluorescent material, which minimizes the discharge start voltage of each discharge space, facilitating driving control for displaying an image (see Col. 15, lines 44-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the fluorescent material with average diameter less than

1 micron and having a thickness less than 7 μm with the purpose of reducing the voltage applied to the fluorescent material, which minimizes the discharge start voltage of each discharge space, facilitating driving control for displaying an image.

Referring to claim 5, Ohsawa discloses the light-emitting device being a PDP.

Referring to claim 6, Ohsawa-Murata discloses the fluorescent material on the rear faceplate having a thickness of not more than about 20 μm . Same reasons for the thickness value stated in claim 1 apply.

Claims 1,3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anandan et al. (US 5,708,324) in view of Murata et al. (US 6,611,099).

Regarding claim 1, Anandan discloses a vacuum ultraviolet radiation excited light-emitting device comprising a discharge space 4 (see Fig 1B) filled with a rare gas between a front faceplate 1 and a rear faceplate 2, and a fluorescent material 6 layer provided on the front faceplate (1) which faces an observer, and further comprising a fluorescent material on the rear faceplate (see Fig 1B).

Anandan teaches the thickness of the fluorescent material on the front faceplate to be optimized to produce a thin layer, which avoids attenuation of light (see Col. 2, lines 30-38), but is silent regarding the limitation of "the thickness being less than 7 μm and the particle diameter being less than 1 micron".

However, in the same field of endeavor, Murata discloses a PDP comprising a fluorescent material having a thickness of less than 7 μm and particle diameter less than 1 micron (lines 58-66 of column 7) and teaches said thickness to be suitable for reducing the voltage applied to the fluorescent material, which minimizes the discharge

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start voltage of each discharge space, facilitating driving control for displaying an image (see Col. 15, lines 44-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the fluorescent material with average diameter less than 1 micron and having a thickness less than 7 μm with the purpose of reducing the voltage applied to the fluorescent material, which minimizes the discharge start voltage of each discharge space, facilitating driving control for displaying an image.

Regarding claim 3, Anandan discloses the light-emitting device being a rare gas lamp.

Regarding claim 4, Anandan-Murata discloses the fluorescent material layer on the rear faceplate having a thickness of not less than about 30 μm .

The Examiner notes that Anandan teaches the thickness of the fluorescent material on the rear faceplate to be in a range from 2 to 10 times the thickness of the fluorescent material on the front faceplate (see Col. 2, lines 53-57).

Response to Arguments

Applicant's arguments filed 6/1/2006 have been fully considered but they are not persuasive.

Applicant argues that Murata does not teach fluorescent material on the front faceplate, examiner agrees.

Further applicant argues that Murata does not teach an average particle diameter suitable for improving the transmissivity of the emitted light and does not even recognize this advantageous effect, examiner further agrees.

However, examiner respectfully presents that it is the teaching of Murata that such small thickness of phosphor layer and such diameter of the phosphor particle provides an advantage to the display which is minimizing discharge start voltage, provides a motivation to one of ordinary skill to combine two references and provides a *prima facie* case of obviousness.

Further, it has been held that the test of obviousness is not whether the features of one reference may be bodily incorporated into the other to produce the claimed subject matter, but simply the combination of references makes obvious to one of ordinary skill in the pertinent art.

Lastly, it has been held that the mere fact that the reference relied on fails to evince an appreciation of the problem identified and solved by applicant is not, standing alone, conclusive evidence of the nonobviousness of the claimed subject matter. The reference may suggest doing what an applicant has done even though workers in the art were ignorant of the existence of the problem.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Guharay
Karabi Guharay
Primary Examiner
Art Unit 2879

8/11/06